

In the second of these series there is only one combination of groups 6 and 4, so that slightly greater weight should be given to the result of the first.

Substituting $\rho = +0''.13$ in the equations of Table III. we find the values of $(C_1 - C_2)$ &c., and the substitution of these in Table II. leads to the separate values of ρ given in the last column of that table. The weighted mean of these is $+''0.131$, and its probable error $\pm''0.008$. These values of $(C_1 - C_2)$ &c. agree very closely with those found from the first general solution.

In the case of some of the stars the material available for the determination of proper motion is scanty, and it is quite possible that in a few cases the adopted motion may be $''0.1$ or $''0.2$ in error, but in the mean the result for ρ cannot be sensibly in error from this cause.

The constant of aberration, therefore, from this series of observations is $20''.57 \pm 0''.01$.

Royal Observatory, Cape of Good Hope :
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Additional Note on Personal Equation. By Truman Henry Safford, Field Memorial Professor of Astronomy in Williams College.

In a former paper I have shown that the two-method personal equation is, on the average, about $0^s.13$ to $0^s.20$ for the ordinary time stars observed at Greenwich, and that it is persistently positive ; or, in other words, that the average Greenwich observer anticipates by eye and ear the time of his own chronographic transits by an amount nearly equal to the "reaction-time" to a sense impression as determined by Wundt and other psychologists. To make rather more definite the astronomical results which I have obtained is the object of the present paper.

As the subject is one which involves two sciences, the research is one which it is difficult to put in logical order.

I will begin, then, by giving the average $e' - e$ for the years 1885 to 1894 inclusive, as derived from the Introductions to the Greenwich Observations. The averages are taken, giving each observer for the year equal weight.

Year.	Mean $e' - e$ s	No. of Observers.	Year.	Mean $e' - e$ s	No. of Observers.
1885	+ 0.158	5	1890	+ 0.180	5
1886	+ 0.145	6	1891	+ 0.122	5
1887	+ 0.170	5	1892	+ 0.165	10
1888	+ 0.212	5	1893	+ 0.123	15
1889	+ 0.162	5	1894	+ 0.162	10

The mean for the ten years is $0^s.160$, or $0^s.03$ more than that obtained by taking the mean of the two values given in my previous paper for Mr. Downing and Mr. Lewis separately.

For the "simple reaction" it is rather difficult to find a standard average value. Wundt, in the edition of 1880 of his *Grundzüge der physiologischen Psychologie*, gives the following as his own means from many experiments :—

Reaction to sound	...	...	...	...	...	...	^s 0.167
„ light	...	...	...	...	...	...	0.222
„ electric stimulation of the skin	...	...	...	...	...	...	0.201
„ sensation of touch	...	...	...	...	...	...	0.218

Hankel found

Reaction to sound	...	...	...	...	...	...	^s 0.1505
„ light	...	...	...	...	...	...	0.2246
„ electric stimulation	...	...	...	...	...	...	0.1546

The purely astronomical mean $0^s.160$, obtained by combining the ten years' results obtainable from the Greenwich Observations, is sufficiently near the general average of these quantities to fully corroborate the conclusions of my previous paper, viz., that the phenomena of personal equation confirm the theories of Bessel and Wundt as to its psychical nature. In fact, we must be very careful to distinguish between the personal equations by the two methods, as they arise from quite different causes,* a fact sufficiently evident when we consider the amounts, $0^s.5$ to $0^s.6$, which the personal equation between the two methods can reach for the same observer.

The most puzzling form of personal equation seems to be that for faint stars observed by eye and ear; and the study of that form by chronographic transits and by Bradley's method used side by side would seem to be a next step to be taken in the investigation of the entire subject.

I would call attention to some oversights in the MS. of my previous paper. In stating the polar equations of Romberg, Morine, Seraphimoff, Ditshenko and myself, the values $0^s.026$, $0^s.025$, $0^s.042$ and $0^s.006$ should be multiplied by $\tan \delta$ or $\sec \delta$ to give the actual time by which the observers named observe relatively too late or too early when the star is very near the pole.

Williamstown, Mass. :

1897 November 30.

* The variation of $e' - e$ from year to year is a marked feature for all, or nearly all, the observers, whether old or young, experienced or inexperienced. See, for example, p. 506 of my paper in the May number of the *Monthly Notices*.